CONERGY

Heat Pump System
Owners Manual

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HEAT PUMP WATER HEATER - OWNERS INSTRUCTIONS

Owners Information

This appliance is not intended for use by small children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.

Your Heat Pump water heater system consists of two major parts;

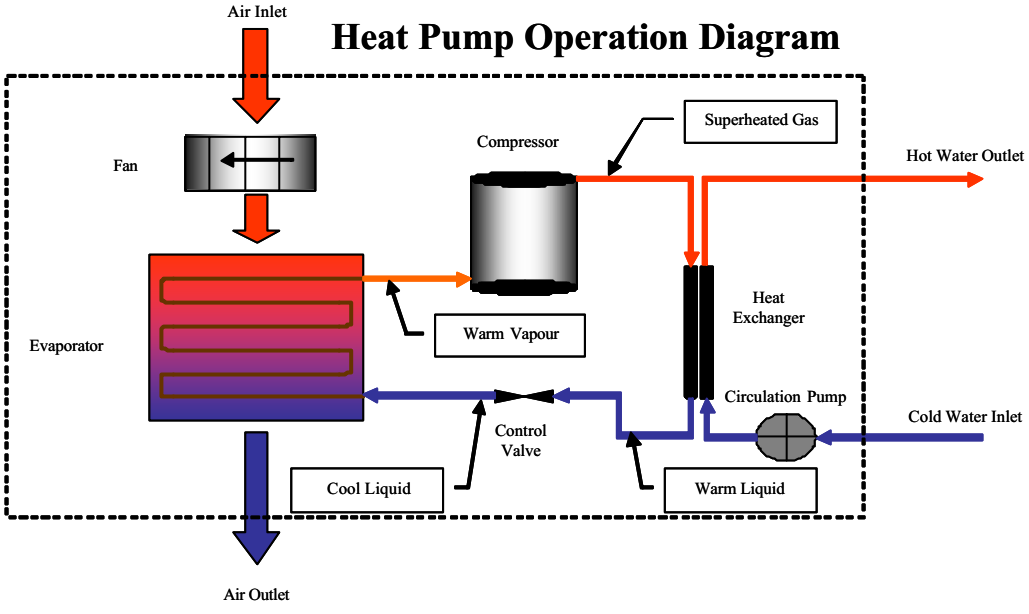
1. a SOLITAIRE storage tank and,
2. a Heat Pump module.

These instructions are additional and complementary to the "Owners Manual" supplied with the SOLITAIRE electric water heater storage tank.
As the owner of a Heat Pump water heater system, there are some questions you may have about the system and how it operates. This manual will provide you with some basic system information.
The SOLITAIRE storage tank is a standard SOLITAIRE electric water heater in which the electric elements have been disabled. The Heat Pump module replaces the disabled electric elements for the generation of hot water within the SOLITAIRE storage tank. Typically the Heat Pump module will produce hot water with an efficiency of around 3.8 to 1 (380%). This means that for every 1 unit of electrical energy you purchase from the supply utility your Heat Pump generates 3.8 units of energy into the water heater. An energy saving of more than 70% when compared to a standard electric water heater.

How Does the Heat Pump Module Work?

A Heat Pump uses simple thermodynamic principles to transfer energy, contained in air being pumped through the module, to heat water passing through the modules internal heat exchanger. The Heat Pump's operational principles are similar as those used in a normal domestic refrigerator except in reverse. In a refrigerator heat energy is drawn from inside the refrigerator (making things cold), concentrated by the compressor then dissipated to the atmosphere via the condenser coil located on the back of the refrigerator cabinet. In a Heat Pump, heat energy is drawn from the outside air (making the air cooler), concentrated by the compressor then transferred into the water passing through the modules internal heat exchanger.

In detail; outside air is drawn into the Heat Pump modules fan and pushed across an internal evaporator. The evaporator transfers energy contained in the air to cool liquid refrigerant causing the refrigerant to increase in temperature and expand into a warm vapour. The warm vapour is then drawn into the compressor where compression causes the temperature of the vapour to increase further, becoming a superheated gas. The superheated gas is then transferred to the Heat Exchanger where it releases its heat energy to the water being circulated through the water heater side of the Heat Exchanger. During the heat exchange process the superheated gas "condenses" back to a warm liquid form before passing through an expansion control valve. As the warm liquid refrigerant passes through the expansion valve the pressure is immediately lowered. The reduction of pressure causes a reduction in temperature of the refrigerant ready for circulation back to the evaporator where the process starts again.



How Do I Operate the System?

The operation of your Heat Pump Water Heater is fully automatic. You do not need to do anything other than turn on the electricity and water supplies.
The Heat Pump module is electrically connected to the storage tank and will start automatically when the water temperature in the storage tank falls below 55°C and continue to run until the water temperature of the complete tank has been increased to 60°C or slightly above.

How Long Will the Heat Pump Run Each Day?

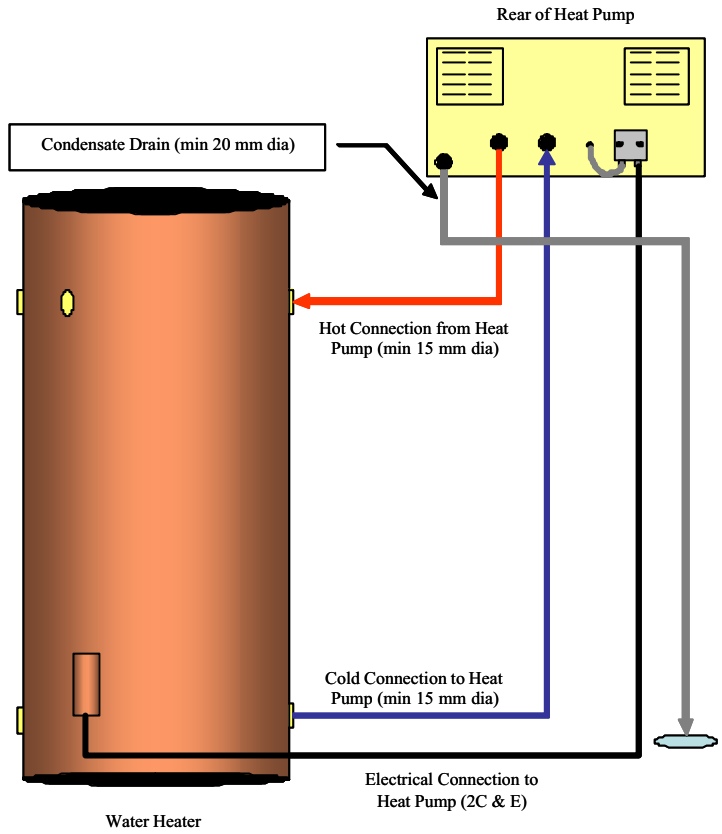
The length of time the Heat Pump module will run each day will vary dependant upon the amount of hot water being used by the household and the average outdoor ambient temperature.
Generally the Heat Pump Module will run longer in winter than in summer because the outside air temperature is cooler in winter therefore contains less energy.
As a running time guide, an average size house using 200 litres of hot water a day in Spring or Autumn would have a running time of 5 to 6 hours depending on the installation location.

How Much Electricity Does the Heat Pump Consume?

Heat Pump Water Heaters are very efficient in their operation.
The efficiency of the system averaged over a full year is in the order of 380% when compared to a standard electric element type storage water heater.
When running the Heat Pump module will consume only a maximum of 0.63 kW of electrical energy but will deposit up to 2.4 kW of energy into the storage tank an efficiency of 380%.
By comparison a standard electric storage water heater would consume 4.8 kW of electrical energy and deposit 4.8 kW of energy into the storage tank an efficiency of 100%.

How do the systems components connect together?

The following diagram shows how the Heat Pump module and the Storage tank are connected together.


Rear of Heat Pump
Condensate Drain (min 20 mm dia)
Hot Connection from Heat Pump (min 15 mm dia)
Cold Connection to Heat Pump (min 15 mm dia)
Electrical Connection to Heat Pump (2C & E)
Water Heater

Why is there condensate coming from the Heat Pump module?

Every system will have a condensate drain running from the Heat Pump module to a suitable discharge location. This discharge location is normally a garden bed or similar inconspicuous position.
Condensate production is normal with all devices which use refrigeration principles for their operation, air conditioners are a good example of condensate discharge.
Condensate occurs when relatively warm moist air passes through the cold evaporator. Moisture contained in the air condenses (deposits) onto the evaporator fins then runs down into the drainage system located under the evaporator. It is this water you see flowing from the condensate drain of the system.
The amount of condensate will vary with the humidity of the location so there is no fixed amount of condensate which should flow from the module. It can vary from 0 to 3 – 4 litres per day.

Why does the Heat Pump stop on cold mornings?

The Heat Pump module has an inbuilt automatic freeze control system for those locations where the early morning temperature in winter can be approaching zero. The freeze control system will prevent condensate on the evaporator coil from forming ice which blocks the air flow path.
If the evaporator approaches freezing the system will commence an automatic cycling program that ensures that the evaporator remains frost free. The Heat Pump module will continue the cycling program until the ambient temperature increases to above 4°C or the storage tank is fully heated.

Does the Heat Pump need sunlight to operate?

Unlike Solar Water heaters Heat Pump water heaters extract their energy from the surrounding air and not from sunlight. For this reason they can efficiently produce hot water any time day or night and even on cloudy or overcast days. It is not uncommon for your system to operate during the night.
As your Heat Pump water heater can generate hot water at any time it does not require any form or auxiliary boosting to maintain the water temperature.

A word of CAUTION

All water heaters have the ability to produce hot water in a surprisingly short time. To reduce the risk of scald injury, it is mandatory under the requirements of Australian Standards AS3500 that an Australian Standards approved temperature control valve be fitted to the hot water supply pipe work. This valve should be checked at regular intervals to ensure its operation and settings remain correct.

What should I do during holidays?

If you are going to be away a week or more, it is advisable to turn off the electricity supply to the system. While there is no damage likely if the electricity is left on you will consume energy through storage tank heat losses which can be avoided.

Warning: *If the hot water system is not used for two weeks or more, a quantity of hydrogen gas, which is highly flammable, may accumulate in the water heater. To dissipate this gas safely, it is recommended that a hot tap be turned on for several minutes at a sink, basin or bath but not a dishwasher, clothes washer, or other appliance. During this procedure there must be no smoking, open flame or any other electrical appliance operating nearby. If hydrogen is discharged through the tap, it will probably make an unusual noise as with air escaping.*

What should I check before making a service call?

If after checking the following points the problem has not been identified, please contact the distributor from whom you purchased the system.
It is important to know that there are no user serviceable components in the system, and as such, it is recommended that no covers be removed and no adjustments made to the system settings by anyone other than an authorised representative.

The system has a long running time

Is there excessive water discharge from the Valves?

If there is a discharge of more than 10 litres per day from any of the system's valves, it indicates there is a problem that requires a service call.

Are you using more hot water than you think?

Often the hot water usage of showers, washing machines and dishwashers is under estimated. Review these appliances to determine if your daily usage is greater than the storage volume of your water heater. If for example you have a 315 litre storage tank and you are using 450 litre of water it is possible that there will be certain times of the day where there maybe insufficient hot water. It is also advisable to inspect tap washers etc. for leakage and replace if necessary.

Condensate is dripping from inside the Heat Pump Module

Check that the discharge location of the condensate drain has not been blocked thereby restricting the condensate flow away from the Heat Pump.

The Heat Pump Module does not Run

Check that the power supply is turned on and that the house Circuit Breakers or Fuses are turned on and correct.

System Maintenance

The Heat Pump water heater is designed such that there is nothing to do regarding system maintenance other than that detailed in the SOLITAIRE Electric Storage Water Heater Owners Manual. The components in the Heat Pump module part of the system do not require maintenance. Personally inspecting or servicing any part of the system is not recommended.
Should you decide to personally inspect the system, it is essential that you use all safety devices required to ensure your safety.

Most importantly the electricity supply must be turned OFF.

As detailed in the Electric Storage Water Heater Owners Manual, each 5 years you should contact the local service agent to replace all safety valves and anodes to ensure continued system life and operational safety. In locations where the potable water has a TDS greater than 600 ppm, this service is recommended each 3 years.

Useful Technical Data

Storage Tank	**Weight Empty (kg)**	**Weight Full (kg)**	**Actual Volume (litres)**
250 litre	88	347	259
315 Litre	103	427	324
400 Litre	114	530	416
Heat Pump Module	**Weight Empty (kg)**	**Weight Full (kg)**	**Noise (dbA)**
HP1S - 25	48	50	48
	Power Consumption (kWh)	**Voltage (Volts)**	**Heat Exchanger**
	0.63	220 - 250	Double Wall

Warranty

1. Your Heat Pump water heater system and its components are covered by a 1 year warranty against defective factory parts or workmanship from the date your hot water unit is installed. If the date of installation is unknown, the warranty commences 1 month after the date of manufacture (which can be found on the serial plate on the hot water unit and Heat Pump module).
2. This warranty is for normal use of the Heat Pump water heater system and covers the repair and/or replacement of any failed component in the hot water unit and Heat Pump module or where necessary, the hot water unit and Heat Pump module itself. Under this warranty Solitaire will repair or replace the component or hot water unit or Heat Pump module free of charge (except for certain transport or travelling time costs which may be payable by the owner under clause 9 below). The decision to repair or replace the component or hot water unit or Heat Pump module will be entirely at the discretion of Solitaire.
3. The warranty only applies to defects in the hot water unit and Heat Pump module which have arisen solely due to faulty materials or workmanship, including correct installation / system selection.

Heat Pump Module

4. If the Heat Pump modules compressor, fan, expansion valve or control components fail within a further 1 year after the end of the 1 year warranty period, Solitaire will provide free replacement items at the nearest approved Solitaire agent or Solitaire office to the owners home. Under this replacement guarantee, the transport, installation and labour costs of delivering the replacement items and removing and replacing the existing hot water unit with the replacement items will be the responsibility of the owner of the existing hot water unit.
5. If the Heat Pump modules heat exchanger fails within a further 4 years after the end of the 1 year warranty period, Solitaire will provide a free replacement Heat Exchanger at the nearest approved Solitaire agent or Solitaire office to the owners home. Under this replacement guarantee, the transport, installation and labour costs of delivering the replacement Heat Exchanger and removing and replacing the existing Heat Exchanger with the replacement Heat Exchanger will be the responsibility of the owner of the existing hot water unit.

5 Year Tank Replacement Guarantee.

6. If an inner cylinder fails on a Solitaire hot water unit (other than a Solitaire "Marathon" model), within a further 4 years after the end of the 1 year warranty period, Solitaire will provide a free replacement hot water unit at the nearest approved Solitaire agent or Solitaire office to the owners home. Under this replacement guarantee, the transport, installation and labour costs of delivering the replacement hot water unit and removing and replacing the existing hot water unit with the replacement hot water unit will be the responsibility of the owner of the existing hot water unit.

10 Year Tank Replacement Guarantee.

7. If the inner cylinder fails on a Solitaire "Marathon" hot water unit within a further 9 years after the end of the 1 year warranty period, Solitaire will provide a free replacement hot water unit and/or Heat Pump module at the nearest approved Solitaire agent or Solitaire office to the owners home. Under this replacement guarantee, the transport, installation and labour costs of delivering the replacement hot water unit and removing and replacing the existing hot water unit with the replacement hot water unit will be the responsibility of the owner of the existing hot water unit.

Scope of Warranty and Guarantee

8. The warranty and replacement guarantee do not apply to any defects or damage not due to faulty factory parts or workmanship, installation / system selection, including but not limited to defects or damage caused by or resulting from:-
   a. accidental damage, abuse, misuse, maltreatment, abnormal stress or strain, harsh or adverse water conditions, contamination or corrosion from particles in the water supply, excessive water pressure, over temperature or neglect of any kind to the hot water unit and Heat Pump module or their components.
   b. alteration or repair of the hot water unit or Heat Pump module other than by an approved Solitaire agent or a Technician of a gas or electricity utility approved by Solitaire.
   c. attachment of any parts or accessories other than those manufactured or approved by Solitaire.

d. faulty or improper installation of the hot water unit or Heat Pump module, including installation otherwise than in accordance with the instructions contained in the owner's manual supplied by Solitaire.
e. Where cold water temperature and pressure relief valve, expansion valve, check valve and strainer is not fitted in areas where mains pressure is likely to exceed 1200 kPa.
f. Freeze damage systems when installed in freeze prone areas.

9. The warranty only applies to the hot water unit and Heat Pump module or components in the hot water unit and Heat Pump module and does not cover any plumbing or associated parts, including but not limited to, pressure limiting valves, stop cocks, non return valves, electrical switches, pumps or fuses, supplied by any person installing the hot water unit or Heat Pump module.
10. Where a hot water unit and Heat Pump module or a component in a hot water unit or Heat Pump module is replaced by Solitaire, the balance of any original warranty or replacement guarantee period will remain effective. The replacement part or hot water unit or Heat Pump module does not carry any additional warranty or replacement guarantee.
11. Where the Heat Pump water heater system is located outside the metropolitan area of a capital city and is:-
    a. more than 25 kilometres from a Solitaire office; or
    b. more than 25 kilometres from a Solitaire agent

    the owner will be responsible under the warranty, for paying the costs of transporting the hot water unit or Heat Pump module or any component in the hot water unit or Heat Pump module to and from an approved Solitaire agent or to a Solitaire office (including the costs of any insurance associated with that transport) or paying the travelling time of an approved Solitaire agent to and from the owner's house premises.
12. Where the warranty applies but the hot water unit and Heat Pump module is installed or located in a position that does not comply with the Solitaire installation instructions or any relevant statutory requirements, the owner of the Heat Pump water heater system will be responsible for the costs of:-
    a. the dismantling or removal of cupboards, doors, walls of special equipment and
    b. any labour required.

    to gain access to and to bring the system / unit to a position that complies with the installation instructions or relevant statutory requirements.
13. Solitaire's obligations under this warranty and replacement guarantee are limited to repairing or replacing the hot water unit and Heat Pump module or components. To the extent permitted by law, Solitaire will not be liable for any loss or damage to furniture, carpets, walls, foundations or any other consequential loss of any kind caused by a defect in the hot water unit and Heat Pump module or any component.
14. Any claim under the warranty or replacement guarantee must include full details of the defect and/or damage to the hot water unit and Heat Pump module or components in the hot water unit and Heat Pump module. All claims must be made within one month of the detection of the defect.
15. In addition to this warranty and replacement guarantee, certain legislation (including the Trade Practices Act 1974 and consumer protection legislation of the States and Territories) gives the owner certain rights, which cannot be excluded, restricted or modified. Nothing in this warranty and replacement guarantee has the effect of excluding, restricting or modifying those rights.
16. In the case of a Heat Pump water heater system acquired for other than personal domestic or household use, Solitaire's liability for a breach of a condition or warranty implied by Division 2 of Part V (other than Section 69) of the Trade Practices Act (1974) and any equivalent State or Territory legislation is expressly limited to any one or more of the following, as determined by Solitaire:-
    a. the replacement of the hot water unit and Heat Pump module;
    b. the repair of the hot water unit and Heat Pump module;
    c. the payment of the cost of replacing the hot water unit and Heat Pump module or of acquiring an equivalent hot water unit and Heat Pump module;
    d. payment of the cost of having the hot water unit and Heat Pump module repaired.

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